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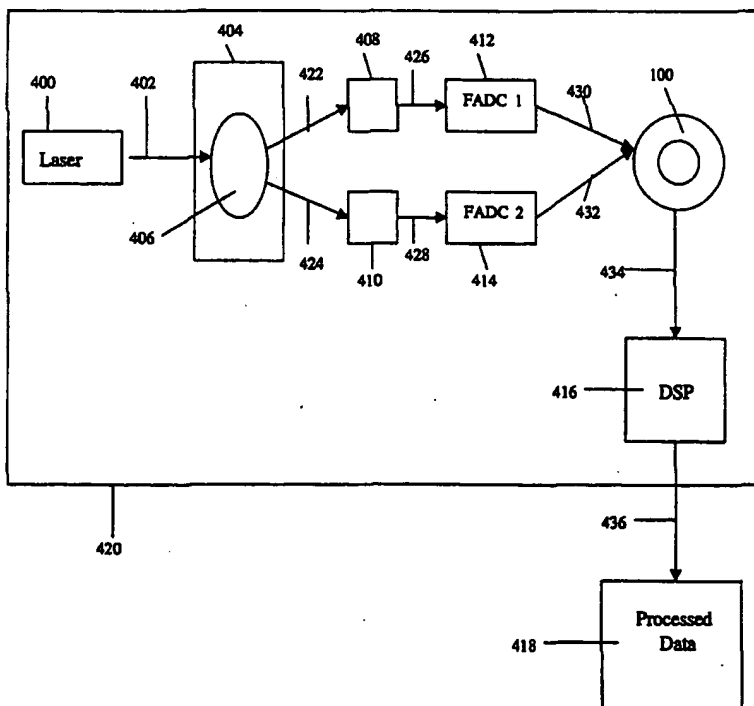
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(54) Title: ZERO DEAD TIME ARCHITECTURE AND METHOD FOR FLOW CYTOMETER

(57) Abstract

A method and apparatus for providing a zero dead time for flow analyzers, flow cytometers, and other measurement devices. A circular buffer is used to store data from a flow analyzer in a plurality of data storage areas, until it is convenient to implement more time consuming data processing procedures. User specified parameters, including sampling rate and/or sampling period, size and number of data storage areas, size of the circular or other buffer, signal-to-noise threshold, order of processing when a plurality of Digital Signal Processors (DSPs) is used, and fixed trailing distance, are used to provide flexible and convenient operation by a user. The probability of missing a rare event occurring within the laser beam or other light beam of a flow analyzer or other measurement device is reduced to zero. Functional equivalents may be used in place of the circular buffer, for example, First In-First Out buffers which route data to a cache for potential re-reading and/or reprocessing or additional processing of data, cascading buffers, etc. Circular and functionally equivalent buffers permit sophisticated data processing in which preceding data (for example, data not meeting the S/N threshold) subsequently are re-analyzed for the possibility that the data are part of a developing event peak, such as a developing shoulder thereof, or part of a declining peak. In addition, logic and algorithms to permit re-examination and potential reprocessing of "old" subthreshold data is utilized to improve the S/N ratio of an event peak.



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